

## Description of a New Alepocephalid Fish, *Bajacalifornia erimoensis*, and a Second Record of *Alepocephalus umbriceps* off Japan

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**Abstract** Three specimens of alepocephalid fishes taken from the deep sea off Cape Erimo, Hokkaido are described. One specimen, characterized by a slender body and a large mouth, is described as a new species under the name, *Bajacalifornia erimoensis*. The two other specimens, identified as *Alepocephalus umbriceps*, represent the 2nd record of the species since it was described 61 years ago on the basis of a single specimen taken from off Aomori, northern Japan.

### Introduction

In the course of studying the ichthyofauna of Hokkaido, the authors collected three interesting specimens belonging to the family Alepocephalidae, taken off Cape Erimo in the depth of 500~1000 meters, between January and March, 1975.

One specimen, characterized by a prominent symphyseal knob on the lower jaw that projects forward beyond a vertical through the tip of the snout, apparently belongs to the genus *Bajacalifornia* Townsend and Nichols, 1925, as redefined by Parr (1952) in his revision of some alepocephalid genera. The specimen does not, however, fit any known species of the genus because of its slender body, large mouth, and other features. We, therefore, describe it as new under the name of *B. erimoensis*.

Two other specimens were readily identified as *Alepocephalus umbriceps* Jordan and Thompson by their unusually large black heads. This species was first described from a single specimen taken from off Aomori, northern Japan in 1914, and no other specimen has since been recorded, as far as the authors know. The specimens are here redescribed in some detail, and counts and proportional measurements are compared with those of the holotype.

The three specimens examined here were preserved in 10% formalin and deposited in the Laboratory of Marine Zoology, Faculty

of Fisheries, Hokkaido University (HUMZ).

Counts and measurements of body parts were made in accordance with the standard practice as outlined by Matsubara (1955: 60~90).

### *Bajacalifornia erimoensis*, sp. nov.

(Fig. 1, Fig. 4, A, C, and E)

New Japanese name: Ukeguchi-iwashi

Holotype: HUMZ 41502, 366 mm in total length, 325 mm in standard length, 970 meter deep, off Cape Erimo, Hokkaido, Japan, on February 14, 1975.

**Diagnosis:** An elongated body with 13 scales in transverse count; short snout and eye; maxillary extending to below posterior end of eye; lower jaw with a symphyseal knob projecting well beyond tip of upper jaw; pectoral rays 16, anal rays 15.

**Description of holotype:** Counts, and proportional measurements are shown in Table 1.

Body elongate and subcylindrical, dorsal profile gently rising to near back of head, then gradually descending. Greatest depth at base of pectoral fin. Head very large, about 1.7 times body depth. Snout long, about 1.5 times eye diameter, broad, not sharp and almost straight in profile, concave at sides between tip of snout and eye. Eye very small, less than 1/5 of head, its dorsal margin not impinging line of dorsal profile. Interorbital broad and flattish except for low ridges of eye margins, its width about equal to eye diameter.

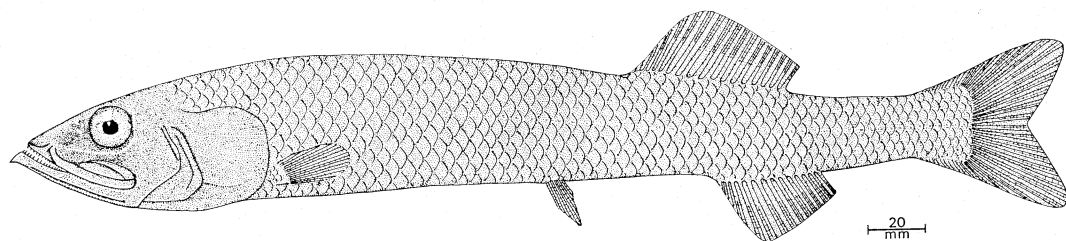


Fig. 1. Holotype of *Bajacalifornia erimoensis*, sp. nov. HUMZ 41502, 325 mm in standard length.

Nostrils just before horizontal line through center of eye, the anterior smaller than the posterior; both not tubular.

Mouth very large and oblique, maxillary extending to posterior margin of eye. Two well developed supramaxillaries on posterior half of maxillary. Lower jaw much projecting beyond the upper, and provided with a pointed knob at symphysis directed forward and downward, and continuing profile of snout downward and forward; a prominent ridge running along lateral side of mandible. Teeth on both jaws in a single row (Fig. 2); premaxillary teeth moderate size, about 15~18 on each side, directed slightly inward posteriorly; teeth on entire lower edge of maxillary minute and close-set, smaller than those of other bones; teeth on lower jaw somewhat larger than those on premaxillary, about 23~25 on each side, those on anterior half larger and sparser than the posterior ones. Nine, somewhat canine-like teeth in a single row on vomer; teeth stronger than those on other bones. Palatine teeth in a single row, nine on each side, a little feebler than vomerine ones (Fig. 2). Gill-

rakers slender and long, the longest about twice length of the very short gill-lamellae. Gill-membranes free from isthmus.

Dorsal fin originating approximately over midpoint between pelvic base and anus, and a little behind midpoint between bases of caudal and pectoral, and ending above posterior 1/3 of anal base; the sixth or seventh ray longest, about equal to half dorsal base. Anal fin originating below center of dorsal base and ending at vertical 2/3 eye diameter behind last dorsal ray; the fifth or sixth ray longest, much longer than half anal base. Caudal fin forked, middle rays about half length of longest one. Pectoral fin short and feeble, the longest about equal to snout; base of pectoral equidistance from tip of lower jaw and pelvic base. Pelvic fin inserted nearly equidistance from caudal base and center of eye, the longest ray about equal to snout length.

Scales on body deciduous, head entirely naked. Lateral line almost straight, running to caudal base along axis of body.

Anus opening before anal origin, the distance about 1/7 of distance from base of anterior ray of pelvic to anal origin.

Color in fresh condition: Uniformly dark brown.

Specimen after preservation in formalin: Body (scales removed) dark brown, head pure black, all fins dark brown.

Name for original locality: off Cape Erimo.

**Remarks:** In Parr's (1951) key to the genera of the family Alepocephalidae, the present species fits the genus *Bathytroctes* in having the following characters: 1) two supramaxillaries, 2) normal premaxillary, 3) body completely scaly, 4) dentition of maxillary equal to that of premaxillary, 5) pectorals and caudal

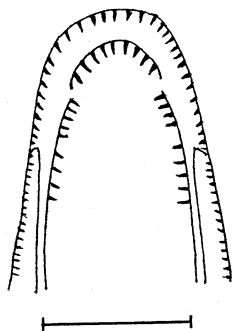


Fig. 2. Diagrammatic illustration of dentition on the premaxillary, maxillary, palatine, and vomer in holotype of *Bajacalifornia erimoensis*. Scale indicates 20 mm.

Table 1. Proportional measurements and counts of the present new species, *Bajacalifornia erimoensis*, and comparison between the present species and three species of the genus *Bajacalifornia*. Counts in parentheses after Parr (1952); those followed by asterisks after Beebe (1933).

	<i>B. erimoensis</i> sp. nov.	<i>B. calcaratus</i> (Weber, 1913)	<i>B. burragei</i> Townsend and Nichols, 1925	<i>B. drakei</i> (Beebe, 1929)
Standard length (mm)	325	152 265	116.4 (4 3/4 in.)	29
Proportional measurements in standard length				
Depth of body	6.77	ca. 5.29	5.5	10
Head length	3.96	3.8 4.34	3.5	2.8
Snout to dorsal origin	1.56			
Snout to anal origin	1.36			
Snout to pelvic origin	1.83			
Snout to anus	1.41			
Proportional measurements in head length				
Depth of caudal peduncle	3.73			6
Snout	3.57	2.86 2.9	3	3.2
Eye diameter	5.47	5 5.55	3.5	3
Bony interorbital width	5.29	4.44 4.06	7	
Upper jaw	2.05	ca. 2.0	2.25	3.78, 3.4*
Lower jaw	1.74	ca. 1.7		
Longest dorsal ray	3.42			
Longest anal ray	3.42			
Pectoral fin	3.42			4.86
Pelvic fin base	4.1	2.54		6.36
Dorsal fin base	1.61			2
Anal fin base	2.28			2.37
Counts				
Dorsal fin rays	18	17	16	18
Anal fin rays	15	17	13	15
Pectoral fin rays	16	13	17	16
Pelvic fin rays	10	9	10	7*
Scales in longitudinal series	55	55 (60~62)	(50~55)	(50~55)
Scales in transverse series	13	18	(15~20)	(10)
Gill-rakers	4+19=23	25 (24~25)	(8+24=32)	(7+19=26)
Pyloric caeca	21	(16~18)	(11)	(21)

fin without produced ray, 6) origin of dorsal fin well in advance of origin of anal, 7) scales entirely absent from head. Parr (1952: 261) later reclassified the genus *Bathytroctes*, dividing it into four genera, *Rinoctes*, *Bajacalifornia*, *Grimatroctes* and *Bathytroctes*. The present species is sharply distinct from the genus *Bathytroctes* [sensu Parr (1952)] by its very small head, anus more close to anal origin than to pelvic fin, and larger number of pyloric caeca.

Among the other genera having small heads, the genus *Rinoctes* is easily eliminated from the present identification by its hard, beak-like, pointed snout that projects beyond the

tip of lower jaw, anus more close to pelvic fin than to anal origin, and 8 pectoral rays. Among the two remaining genera, *Bajacalifornia* and *Grimatroctes*, the characters of the present species show a conspicuously mosaic distribution, falling into the ranges of the latter genus in regard to head length and eye diameter, and falling intermediate between the two in snout length. In many other characters that Parr used to separate the two genera, however, the present species agrees closest with the genus *Bajacalifornia*. It is especially significant that Parr's (1952: 263) diagnostic characterization of the genus, "symphysis of lower jaw with a prominent

ventral knob, projecting forward beyond the vertical from the point of the snout, and continuing the dorsal profile of the head downward and forward", and pectoral rays 13 or over, agrees closely with the present species.

In the genus *Bajacalifornia*, three species have been described so far: *B. drakei* (Beebe), from the western Atlantic, *B. burragei* Townsend and Nichols, from the Gulf of California, and *B. calcaratus* (Weber), from the Straits of Macassar and the Ceram Sea. Among these species, *B. erimoensis* is sharply distinct from *B. drakei* in having 13 scales in transverse count (10 or less in latter), eye smaller in diameter, and maxillary extending to below posterior rim of eye (not extending to anterior rim of eye) (Table 1). From *B. burragei*, the eastern Pacific species, it can apparently be distinguished by its fewer scales

in transverse count (13 as against 15~20), lesser depth of body (6.77 in standard length instead of 5.5), shorter head (3.96 in standard length as against 3.5), smaller eye (5.47 in head, 3.5), fewer anal rays (15 instead of 13), fewer pectoral rays (16 instead of 17), fewer gill-rakers (23 instead of 32), maxillary extending to below posterior rim of eye (to below middle of eye), and so on (Table 1). *B. erimoensis* is similar to *B. calcaratus* in its small eye, length of upper and lower jaws, and maxillary extending to below posterior end of eye, but it is sharply distinct from *B. calcaratus* in the number of scales in transverse scales (13 instead of 18), numbers of pectoral and anal rays (16 and 15 as against 13 and 16), body depth (6.77 as against 5.29), and snout length (3.57 instead of 2.9 in head length) (Table 1).

Table 2. *Alepocephalus umbriceps*: Proportional measurements and counts of the present two specimens (A, HUMZ 41503; B, HUMZ 45155), and comparison between the present specimens and the holotype described by Jordan and Thompson (1914). Asterisk indicates citations from Parr (1952).

	Present specimens		Jordan and Thompson (1914), Holotype
	A	B	
Total length (mm)	558	720	270
Standard length (mm)	490	632	
Proportional measurements in standard length			
Depth of body	5.33	5.85	5.33
Head length	3.0	3.14	2.75
Snout to dorsal origin	1.46	1.45	
Snout to anal origin	1.41	1.37	
Snout to pelvic origin	1.88	1.83	
Proportional measurements in head length			
Depth of caudal peduncle	4.66	4.73	
Snout	4.23	4.57	
Eye diameter	4.94	4.79	4.0
Bony interorbital width	6.79	6.28	6.5
Upper jaw	2.81	2.63	2.66
Lower jaw	2.23	2.14	
Dorsal fin base	2.51	2.31	2.5
Anal fin base	2.51	2.26	
Counts			
Dorsal fin rays	18	17	17
Anal fin rays	17	20	17
Pectoral fin rays	11	11	11
Pelvic fin rays	7	7	
Pored scales in lateral line	68	70	65
Gill-rakers	7+19	7+19	7+19
Pyloric caeca	15	18	18*

*Alepocephalus umbriceps* Jordan and Thompson  
(Fig. 4, B and F.)

Japanese name: Konnyaku-iwashi

Specimens: HUMZ 41503, 558 mm in total length, 490 mm in standard length, 530 meter deep, off Cape Erimo (41°35'N, 143°42'E), Hokkaido, Japan, on January 29, 1975. HUMZ 45155, 720 mm in total length, 632 mm in standard length, 500~600 meter deep, off Cape Erimo, Hokkaido Japan, on March 14, 1975.

**Description:** Counts and proportional measurements are shown in Table 2.

Body somewhat subcylindrical anteriorly, compressed posteriorly. Head very large, length much greater than body depth; opercular membrane extending to near pectoral base. Opercular with two or three ridges radiating from fixed portion to free margin. Snout obtuse, a little longer than eye diameter. Eye large, slightly longer than interorbital width; dorsal margin of eye in line with dorsal profile of head. Postorbital region swollen outward by muscle from orbit to upper corner of preoperculum. Nostrils just before eye, the anterior much smaller than the posterior one; both not tubular.

Mouth moderate and oblique, tips of both jaws in same vertical line, maxillary extending to below middle of eye; two well-developed supramaxillaries. Teeth on both jaws small, in single row, not canine-like; premaxillary teeth directed inward, somewhat enlarged anteriorly; teeth on entire of lower edge of maxillary minute and delicate, conspicuously smaller than those of other bones; teeth on lower jaw somewhat smaller than those on premaxillary. Teeth in single row on palatine, about same size as those on lower jaw. Toothless on vomer. Gill-rakers flattish (Fig. 3, A), rather long, longest one much longer than gill-lamella and about 2/3 of eye diameter.

Dorsal fin originating well behind midpoint of body, and just above anus; its base about equal to anal base; without produced rays. Anal fin originating half an eye diameter behind vertical through origin of dorsal fin and ending at vertical half an eye diameter behind last dorsal ray; the rays similar in structure and shape to those of the dorsal fin. Caudal fin forked, middle rays half length of longest. Pectoral fin inserted nearly midway

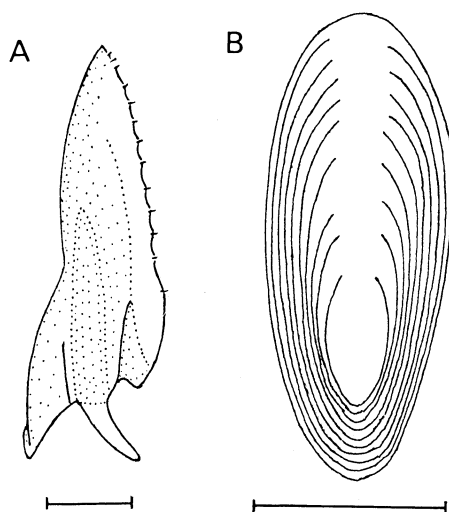


Fig. 3. Lateral view of the longest gill-raker on the first arch (A) and body scale (B) of *Alepocephalus umbriceps*. Scales indicate 5 mm.

from tip of snout to anus, without produced rays. Pelvic fin inserted nearly midway between pectoral and anal insertion, the rays about equal in length to eye diameter. Scales on body elongated and cycloid (Fig. 3, B), imbricate and deciduous; head entirely naked. Lateral line distinct, almost straight, without enlarged scales.

Color in formalin: Body (scales removed) dark brown, head pure black; all fins black.

**Remarks:** Counts and proportional measurements (Table 2) of the two specimens described above agree closely with those of the holotype (No. 6030 a, Catalogue of fishes, Carnegie Museum) as described and figured by Jordan and Thompson (1914). Parr (1952) reviewed the 16 species of the genus *Alepocephalus* and gave a key to their identification. The Erimo specimens fit *A. umbriceps* on the basis of functions used in his key to express the proportions in per cent of standard length.

Specimens of *A. umbriceps* have not been reported since the species was originally described by Jordan and Thompson (1914) from one specimen, 270 mm in total length, collected from Aomori, northern Japan. It is, therefore, of considerable interest that the present specimens were taken from off Cape Erimo near the type locality, after 61 years' absence.

Recently, Iwamoto (1975) referred a specimen

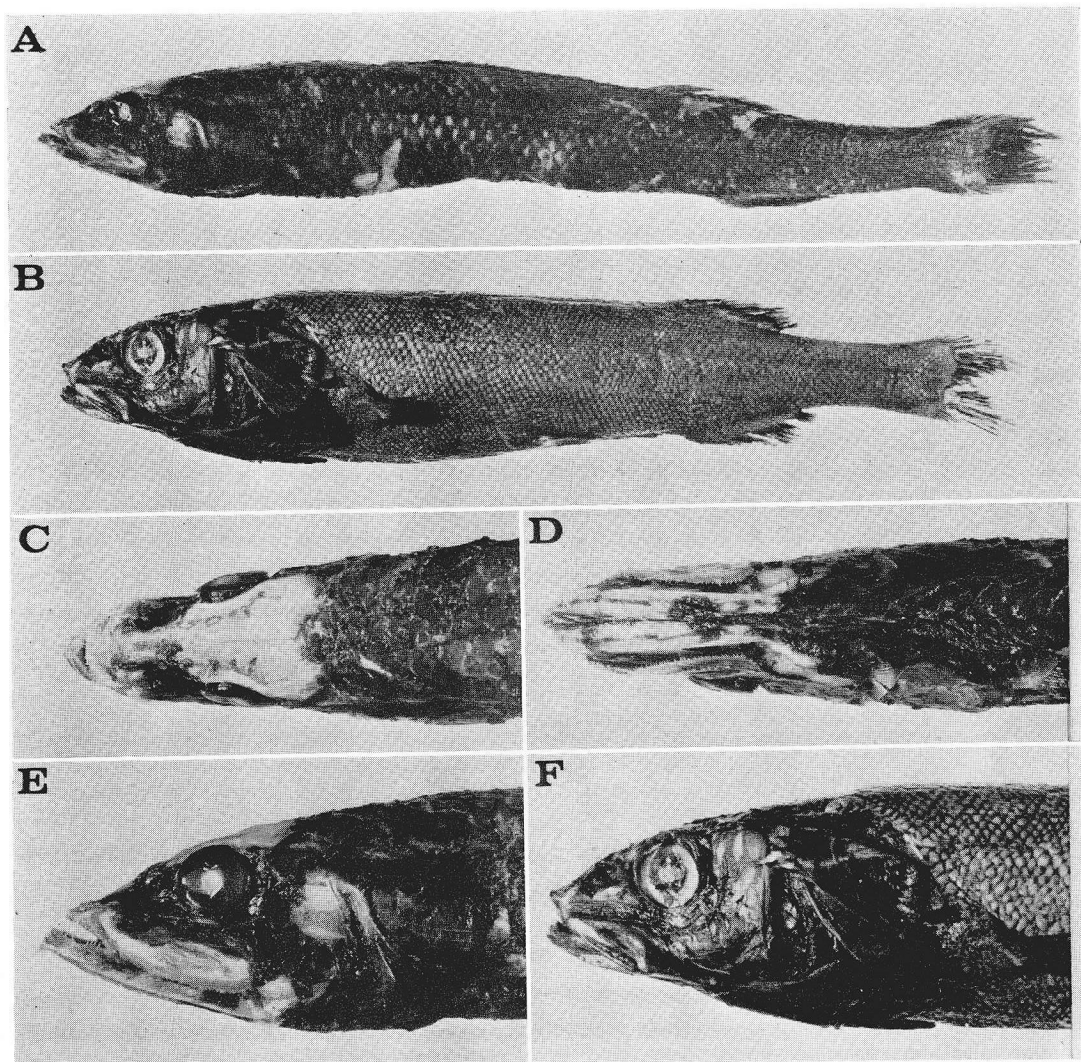


Fig. 4. Holotype of *Bajacalifornia erimoensis*, sp. nov. (HUMZ 41502) and a specimen of *Alepocephalus umbriceps* (HUMZ 41503). *B. erimoensis*: lateral view (A), dorsal (C), ventral (D) and lateral (E) views of head; *A. umbriceps*: lateral view (B), lateral view of head (F).

(SU 23777, 31 cm in standard length) of *A. umbriceps* to compare with *A. blanfordii* from Hawaii. In the comparisons, he noted that the specimen has only 7+9 gill-rakers on the outer arch and teeth in narrow bands on mandible and palatine. But it was corrected by his reexamination that the specimen has 7+19 gill-rakers and teeth in single row on two bones (personal communication). On the basis of these corrections, his specimen (SU 23777) appears to be identified as *A. umbriceps*. This specimen was collected from Misaki Sea in 850 fathoms by S. Watase on April 30, 1906.

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boat 85th Chiyoki-Maru for supplying us with the specimens.

# Literature cited

- Beebe, W. 1929. Deep sea fish of the Hudson Gorge. Zoologica, 12 (1): 1~19, fig. 1.
- Beebe, W. 1933. Deep-sea fishes of the Bermuda Oceanographic Expeditions. Family Alepocephalidae. Zoologica, 16 (2): 15~93, figs. 1~25.
- Iwamoto, T. 1975. First record of a slickhead (Alepocephalidae) from Hawaiian waters. Japan. J. Ichthyol., 22 (1): 1~6, figs. 1~2.
- Jordan, D.S. and W.E. Thompson. 1914. Report of the fishes obtained in Japan in 1911. Mem. Carnegie Mus., 6 (4): 215~313, figs. 1~87, pls. 24~42.
- Matsubara, K. 1955. Fish morphology and hierarchy. Pt. 1. Ishikazi-Shoten, Tokyo, xi+789 pp., 289 figs. In Japanese.
- Parr, A.E. 1951. Preliminary revision of the Alepocephalidae, with the introduction of a new family, Searsidae. Amer. Mus. Novitates, (1531): 1~21.
- Parr, A.E. 1952. Revision of the species currently referred to *Alepocephalus*, *Halisauriceps*, *Bathytroctes* and *Bajacalifornia* with introduction of two new genera. Bull. Mus. Comp. Zool., Harvard Univ., 107 (4): 255~269.
- Townsend, C.H. and J.T. Nichols. 1925. Deep sea fishes of the "Albatross" Lower California Expedition. Bull. Amer. Mus. Nat. Hist., 52:

1~20, pls. 1~4.

Weber, M. 1913. Die Fische der Siboga Expedition. Siboga Expeditie, Leiden, 710 pp., 123 figs., 12 pls. In German.

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## 日本から採集されたセキトリイワシ科魚類の1新種 ウケグチイワシおよび再記録種コンニャクイワシ

尼岡 邦夫・阿部 晃治

襟裳岬沖 500~1000m の深みから採集された3個体のセキトリイワシ科魚類を調査した。1個体は下顎が著しく突出し、その縫合部に前向の1突起を具えることなどから本邦から未報告の *Bajacalifornia* ウチグチイワシ属 (新称) に含まれる種類であった。本属には世界各地から4種類が知られているが、本個体は体が細長いこと、横列鱗数が少ないこと、口が著しく大きいことおよび吻が短いことなどから、これらのいずれの種類にも同定されず、新種ウケグチイワシ *Bajacalifornia erimoensis* として記載した。他の2個体はコンニャクイワシに同定された。本種は1914年青森から得られた標本にもとづいて Jordan and Thompson によって記載されて以来報告がなく、第2番目の記録である。

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